



Nurses: Healthcare and Healthcare Informatics

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ABSTRACT:

Objectives: To identify the current status and challenges faced by nurses in using informatics in health care.

Methods: This review provides critical review and analysis of clinical informatics used by nurses in providing patient care. An in – depth survey of all the related literatures and published articles in the selected area was done to explore the progress done in nursing curriculum regarding use of health technology in patient care and problems faced by nurses in using it.

Findings: Healthcare has evolved by leaps and bound with advancing technology and the increasing need of the ever-growing population. The effective use of technology can only be ensured with updated knowledge and skills. If the healthcare personnels are not acquainted to the advance technology, it may be barrier for them in providing efficient patient care. Health Informatics has become the need of the hour for improving patient care and the nurses being the backbone of the healthcare system need to be proficient in handling it.

Novelty: The role of technology in healthcare can never be ignored. This article identifies the gaps in the use of informatics by nurses and ways to overcome the challenge. This will thus improve patient care in both government and private hospitals.

Introduction

Informatics in healthcare system is an interprofessional area which integrates the data related to biomedical health, knowledge and information in order to improve the patient care services. Thus, it is science of information with meaning. The use of health informatics began almost 70 years ago in USA and Europe after World War II which was a breakthrough for doctors and researchers to diagnose medical diseases.^[1] Informatics in health care system also called Clinical Informatics (CI), earlier called Health Informatics (HI) is a novel form of information technology. It has tools designed for improving patient care services.^[2] With advancements in technology, patient care services have improved in

various aspects beginning right from admission to the discharge.^[3] Improving standards of patient care requires effective and efficient methods and resources which enables the healthcare professionals and healthcare policies to be more patient centered.

As per Institute for Healthcare Improvement, PCC has been explained as – “care that is truly patient-centered and makes patient and their care givers as vital part of care team, they collaborate with health care professionals in making clinical decisions which puts responsibilities in patient’s hand along with tools that is required to take over the responsibility”.^[4] PCC not only ensures transparent communication between health care providers, departments and health care settings, it also



ensures respectful and efficient coordination among health care team members.^[5] But it is also important to know whether all the members of health care team are able to smoothly use informatics for patient care. HI is not only used by clinicians or patients but, also by other members of health care team. Lack of awareness and knowledge about e-health, its benefits and advantages also pose a challenge.^[6]

Though clinical informatics has been in practice since 1950's in western countries but in India it came into existence in the early 1990's. ^[7] It has gained enormous momentum in recent years as now healthcare industry is using medical and healthcare data to improve facilities and health care utilization, like there is growing surge for use of artificial intelligence (AI) and robotics in health care. After covid-19 pandemic, healthcare industry witnessed increased reliance on virtual models of care using mobile and other social media platforms.^[8] But despite of evolution of technology in healthcare industry, the nurses are found to face problems in its usage for patient care.^[9] There many examples which presents that how digital technology has benefitted the nursing profession as whole like telemedicine, use of smart phones-based applications which are not only supplementing nursing care but also evolving our nursing education system by providing remote learning.^[10-11]

But, due to lack of pace with advancing technologies in health, nurses still face challenges to use it. A survey revealed that less than 35% of community nurses and colleagues feel that technology saves time and increases productivity whereas, almost 75% nurses faced problem using technology like internet, e-health records leading to shortfall of time for nursing care.^[12] Especially when it comes to older generation of nurses working in government and private sectors, the challenges are more. All these limitations act as barrier to benefits that nurses can have in patient care management and outcomes. This calls for immediate intervention so as to prepare future nurses for embracing the technological advancement into our profession globally.

The primary aim of this paper is to review the perception and competency of nurses in handling the evolving technology in health care sector primarily focussing on health informatic system in its global sense and its focal components. Digitalization in health care has led to radical changes in organization, procurement and

deliverance of health resources and services, which has brought forth unparallel health standards in the society. Despite the fact that nurses play a pivotal role in health care, their roles and skills in handling health informatic system still remains at large a big question. This attitude of nurses is largely propelled because of the lack of exposure to technology and to many other elements. The review has tried to illuminate and underpin the need for acquiring and refining the skills of nurses in manoeuvring technology.

Methodology

The literature regarding healthcare and healthcare informatics was collected from Google search engine, Google Scholar, Pubmed, IEEE conference papers and Published reports and articles. The objectives of the review were: done to identify the current status and challenges faced by nurses in using informatics in health care. Only open accessed articles were retrieved. The keywords used for search were: "healthcare", "informatics", "nursing informatics", "clinical informatics", "medical informatics". The literature published form 2019 to till date was accessed. The inclusion criteria for review were: research studies published between 2019 to 2021, review and cross-sectional studies.

Results

The review is presented in the following headings: Informatics in nursing – government, clinical and nursing curriculum, Types of health informatics (HI) used in healthcare and challenges & Ways to Overcome.

Informatics in Nursing:

Over last 25 years immense advancement has taken place in information technology, it has eased decision making process for nurses thereby creating significant opportunities for them to access patient data easily.^[12] Nowadays we have faster access to information and better software to transform patient related data to useful information. It is not only limited to meet physiological needs of the patient but there has been marked development in various areas like genetics and genome, less invasive intervention and more technology, printing, three-dimensional, robotics, biometrics, a sick computer, computer aided instruction, AI etc. ^[13] Nursing informatics evolved from the French word "*informatique*" which means field of computer science



which is concerned with patient related information such as nursing information.^[12]

NI in India is still emerging and continues to be an important aspect in health care system across our country.^[14] Some of the key progress our country has made is mentioned below:

Government: Many hospitals, dispensaries and medical colleges were established in our country during pre-independence era. During 1947, about 7400 hospitals with bed ratio of 0.24/1000 were present.^[15] Thus, Britishers left framework for development of healthcare system in our country. Report submitted by Bhore Committee led to decentralization of health administration and in 2008, Health Management Information system was launched in our country.^[16] Further, in 2018 Ayushman Bharat Digital Mission was launched in order to improve the usage of health service and promote digitalization in the country using a “citizen-centric approach”. In order to improve quality of nursing care and improve nursing competency in India, Directorate General of Health care services-Nursing and Ministry of Health and Family Welfare has planned to start Nursing Informatics Cell in health care settings.^[15]

Nursing Curriculum:

The Indian Nursing Council has made efforts by introducing computer education as a part of the curriculum from the past few years of various courses like GNM (15 Hours), B.Sc. Nursing (30+20 Hours) and M.Sc. Nursing (25 Hours).^[17] Inspite of the efforts taken up INC by introducing computer education in the curriculum, the knowledge and use of computers remains limited to just clearing the theoretical examinations. The gap in application of knowledge about computers in healthcare by nurses still remains unaddressed globally.

The reason for this gap includes lack of interest of nursing faculty in this area, lack of leadership to support changes and absence of specific informatics criteria in education standards laid by regulatory bodies.^[18]

Clinical Areas:

Along with introduction of computer education in nursing curriculum, INC has also encouraged state councils to develop websites that may promote continuous nursing education for nurses.

But, the use of health care informatics by nurses and other health care professionals is in poor state in Asian

countries. Usage and accessibility of health care informatics and its tools like HIS, CPRS, EMR for patient care is in poor state in various parts of our country India. Only some private and government hospitals in metropolitan cities like Delhi, Mumbai, Chennai, Kolkata has access to it. Also, due to shortage of staffs in clinical area nurses feel burdened and sometimes frustrated to use it.^[19]

Types of HI used in Health Care:

In order to define Nursing Informatics, Technology Informatics Guiding Educational Reform (TIGER) was proposed for nurses as well as nursing students with a view to provide quality patient care in digital platform and electronic health records was introduced.^[20] Various forms of informatics in hospitals are being used to improve PCC like: electronic medical records, planned nursing interventions, computer generated documentations, CPRS, HIS, computer generated nursing care plans and critical pathways, e-billing for procedures and medications, barcode generated medication administration and use of telenursing system for patient counselling and health related follow-ups.^[21] Informatics in nursing has also improved nursing researches too as it has helped in providing better access to evidences like: CINHALL, Ovid, PubMed, NANDA, SNOWMED.^[22]

Challenges & Ways to Overcome

In our country, many nursing schools do not provide nursing informatics related information to undergraduates and postgraduates, only few schools provide an elective course in informatics thereby avoiding their elective selection by students.^[23] Many faculty in nursing also do not have adequate knowledge and skills regarding NI therefore the same is passed to the students. Many nurses in government as well as private hospitals face difficulty in accessing the data in the computers as they are not comfortable using it. The problem is encountered most often by the senior nurses who are having more than 15-20 years of experience in the clinical area.

One of the studies highlighted the problem faced by nurses in practicing nursing informatics in clinical area like entering data in patient record. It also mentions the concern that though nursing profession is skill oriented but nursing informatics still is not functioning as an independent domain, there is gap between knowledge and skill that needs to be addressed.^[24]



Hence, there is a need for collaboration between professional organizations, universities and colleges so that both students and faculties can learn about NI and its applications. This will not only help the faculties and nurse educators in clinical areas to develop their knowledge in NI but will also make them skilful.

Discussion:

The present study has highlighted how Informatics and Health Informatics have played a role in Patient Centered Care. Even though the introduction of Informatics into Nursing Curriculum has boosted the scope for nurses in navigating the tides of evolving technology but still the nursing fraternity is on the backfoot when it comes to tutoring the next generation of nurses regarding informatics. There needs to be streamlining of nursing curriculum with advanced technology as we are dealing with generation of students who are technologically sound.^[25] The present review highlights the lacunae of our nursing education system, challenges nurses face in the clinical area and ways to overcome those challenges. Similar findings were reported by De Leeuw, Woltjer and Kool reported that nurses who had insufficient education in digital areas were having stress and frustration in using health informatics.^[24,25] The present review also highlights the need for integrated curriculum to overcome the challenge nurses face to use informatics in clinical area which is also supported by findings of a study by Isidori et.al.^[26]

Conclusion:

The present study has tried to emphasise the importance of Informatics in Nursing Curriculum and Healthcare. The review has brought forth the difficulties and the incompetency of nurses in handling technology with ease and to adopt it as part of their daily routine work. The review has stressed on the regularisation of the Nursing Curriculum and the need for updation of nurses in the ever-evolving technology in healthcare sector and patient care. Only if emphasis is laid on marked up education regarding informatics, only then the future nurses will be at ease in getting through the maze of technology. Therefore, focus on training nurses and educating nursing students about the effective use of technology for improving patient care is of utmost importance. It should also be taken into consideration

that Informatics should not impede critical thinking of nurses or become a barrier in patient care. The present review also recommends for studies on use of AI/CDS based tools for patient care among new generation of nurses in India. This will help us to identify the challenges and help in bridging the gap that still exists after technological advancements.

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